P&H 4100C BOSS AC Shovel building on proven success

Mine operations and maintenance managers demand the best from their loading tools. For this reason, Komatsu Mining has been the electric mining shovel market share leader and preferred equipment supplier to the world’s toughest mining environments for over 100 years.

Komatsu is proud to offer the P&H 4100C BOSS AC electric mining shovel. The P&H shovel line is combining its solid reputation of reliability with the proven Centurion electrical control system, industry leading IGBT AC technology, rugged structures and the industry’s only direct field service and support network to set the industry standard for electric mining shovels.

Increases in availability and productivity ultimately lead to the lowest cost per ton and the most efficient ultra-class loading tool available in the industry today. P&H shovels dig deeper into the realms of productivity, cost per ton and the most efficient ultra-class loading tool available in the world. P&H shovels are built on proven success.

The P&H AC performance edge

We’ve achieved better performance throughout the entire shovel. That includes higher speed and peak horsepower. The shovel features improved electrical availability and overall reliability. In addition, the structures have been optimized to work efficiently with AC technology.

The benefits are clear:
- Better cycle time and utilization
- Improved job efficiency
- Higher rates of availability

Attachment of choice for the world’s toughest applications
- Twin-leg dipper handle – Stable dipper trajectory, faster cycle times, higher productivity
- Rack and pinion crowd – Less maintenance, all weather performer
- Optima dippers – Mine-matched dippers with adjustable pitch braces for precise rake angles

Rugged components
- Dual hoist motors – Balanced and evenly distributed load
- Delta drive – Improved shoe-to-tumbler engagement
- Planetary transmissions – Proven long life on swing and propel with over 20 million hours logged

Technology
- Centurion electrical control system – Superior performance, monitoring and data integration capabilities
- Universal shovel interface – Send and receive data with any mine management system
- Pre/veil remote health management – Real time machine health and performance management

World-class cab
- Smart ergonomics
- Clear sight lines
- Easy access to command and control functions
- Access to key data on machine health and performance provided by Centurion electrical control system

Smart Solutions
- Access to data and control functions
- Access to key data on machine health and performance provided by Centurion electrical control system

We are driven by achieving the lowest total cost of ownership for our customers:
- Quality components
- Focus on machine availability and productivity
- Heavy-duty structures
- Komatsu Mining field support

Komatsu and ABB:
Two leaders combine to deliver breakthrough productivity and performance. ABB is the global leader in drives with 40+ years of experience.
- ABB’s Direct Torque Control has the best dynamic performance in the industry
- Our AC drives are compact, air-cooled, modular
- Maintenance-friendly modules are easy-to-replace

Komatsu Mining is the worldwide leader in electric mining shovels. The P&H 4100C BOSS AC sets the standard in performance and productivity.

P&H 4100C BOSS AC Electric Mining Shovel

Proven performance
P&H AC-Drive shovels are exceeding customer requirements and expectations:
- 3% faster cycle times
- 2.5% increase in availability
- 5% increase in productivity

Providing our customers:
- Lowest total cost of ownership
- Highest productivity
- Superior machine reliability and durability

We set the industry standard for electric mining shovels

A closer look
The P&H 4100C BOSS AC utilizes proven components:
- Common motors and drive line-up as proven P&H 4100XPC AC and P&H 2800XPC AC machines, adapted to handle additional swing motor
- Structures developed with advanced design software and field data collection
- Motors designed and manufactured by Komatsu specifically for electric mining shovels
P&H 4100C BOSS Electric Mining Shovel – AC Drive

General Specifications

Working ranges

<table>
<thead>
<tr>
<th></th>
<th>Feet</th>
<th>Meter</th>
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<tbody>
<tr>
<td>Height of cut</td>
<td>16.9</td>
<td>5.11</td>
</tr>
<tr>
<td>Radius of cut</td>
<td>24.7</td>
<td>7.52</td>
</tr>
<tr>
<td>Floor level radius</td>
<td>16.3</td>
<td>5.25</td>
</tr>
<tr>
<td>Tail swing radius</td>
<td>11.6</td>
<td>3.55</td>
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<tr>
<td>Operator eye level</td>
<td>9.8</td>
<td>3.00</td>
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Capacity

<table>
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<tr>
<th></th>
<th>Feet</th>
<th>Meter</th>
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<tbody>
<tr>
<td>Nominal payload*</td>
<td>90.7</td>
<td>99.7</td>
</tr>
<tr>
<td>Nominal dipper capacity</td>
<td>44.3 m³</td>
<td>58.0 m³</td>
</tr>
<tr>
<td>Optimum truck size</td>
<td>172-363</td>
<td>190-400</td>
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</table>

Electrical control

Centurion supervisory controller provides direct integrated communication with motor drives giving precise motor control and fast cycle times. Real-time multi-tasking capability allows for optimal machine logic sequencing, monitoring and control.

Centurion I/O system uses ‘Proflus’ communication protocol for seamless integration of all shovel subsystems and future expandability. Low-voltage 24V DC I/O drop points feature open and short circuit detection for improved diagnostics and troubleshooting.

Centurion information system's enhanced Graphical User Interface (GUI) features intuitive, icon-based screens to display vital information such as shovel status, troubleshooting information, and optional production monitoring data and operator feedback.

P&H digital AC drive provides precise, reliable, solid state power to the main motion motors.

Electrical control systems

<table>
<thead>
<tr>
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<th>Drive Power</th>
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<tbody>
<tr>
<td>Head motion</td>
<td>690 kVA</td>
</tr>
<tr>
<td>Hoist motion</td>
<td>464 kVA</td>
</tr>
<tr>
<td>Propeller motion</td>
<td>1160 kVA</td>
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<tr>
<td>Swing motion</td>
<td>3460 kVA</td>
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Power requirements

<table>
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<tr>
<th>Supply voltage*</th>
<th>7200 or 13800V</th>
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<tbody>
<tr>
<td>Supply transformer</td>
<td>Minimum 3300kVA</td>
</tr>
<tr>
<td>Voltage per customer requirements</td>
<td>25 kVA</td>
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</table>

Dipper & dipper trip

Optima dippers combine consistent productivity with high durability and maintainability. Dippers are configured to mine specific conditions and capacity requirements from a variety of combinations of body and lip designs, as well as other unique Komatsu technologies. Specific wear packages and S&T styles can be cooperatively specified.

P&H TripleFlex system utilizes a brushes DC electric motor with sealed planetary drive unit for reliable trip and slack take up operation.

Swing

Two modular P&H planetary gear cases of proven design and a single piece forged swing gear transmit torque for fast cycle times. Spring set air release disc brakes – one per motor.

Splash lubrication system.

Propel

Propel on demand provides rapid transfer to propel mode. Rupter transfers allow frequent positioning of the shovel to the bank resulting in faster cycle times and more efficient digging.

Two rugged P&H planetary gear cases of proven design independently transmit torque to the drive sprockets, producing the effective effort required for fast, efficient propel and positioning operations.

Delta drive low tension sprocket drive system with heavy duty cast crawler shoes.

Spring set air release disc brakes – one per motor.

Crown

Powerband V-belt drive between motor and gear case absorbs shock loads.

First and second reduction gearing in enclosed gear case for reliable splash lubrication, ease of maintenance, and extended component life.

Twin leg dipper handle with tension box and rack and pinion drive has inherent stability in the bank for optimal digging.

Spring set air release disc brake.

Hoist

All gearing housed in single enclosed gear case with filtered and cooled oil fed to all bearings in addition to splash lubrication for reliable operation and ease of maintenance. Large 68” diameter hoist drum for extended rope bending life. Ferrule becket system and dual electric tuggers are standard for efficient rope change.

Spring set air release disc brakes – one per motor.

Cable data

<table>
<thead>
<tr>
<th>Hoist (wire rope)</th>
<th>70 mm</th>
<th>2.75 in. dia.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suspension (bridge strand)</td>
<td>102 mm</td>
<td>4.00 in. dia.</td>
</tr>
<tr>
<td>Dipper trip (wire rope)</td>
<td>19 mm</td>
<td>0.75 in. dia.</td>
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</table>
P&H 4100C BOSS AC Electric Mining Shovel

Overall dimensions

- **A** Width: 14.0 m (45 ft. 10 in.)
- **B** Length: 17.2 m (56 ft. 5 in.)
- **C** Height over gantry: 13.4 m (43 ft. 10 in.)
- **D** Width of crawler shoes: 3505 mm (138 in.)
- **E** Width of crawlers (138") : 12.8 m (41 ft. 11 in.)
- **F** Length of crawlers: 11.6 m (38 ft. 0 in.)
- **G** Ground clearance: 1.1 m (3 ft. 6 in.)
- **H** Height — ground to bottom of counterweight slabs: 2.8 m (9 ft. 1 in.)

Machinery deck plan

- Air compressor
- Hydromechan New I/O Box
- Electrical cabinet
- Lubrication room
- Hoist motor
- Lube room U/O Box
- Lube reservoir (138 kw / 130 kw / 97,836 in)
- Electrical shielding
- Swing motor and transmission
- Hoist drum
- Front wall I/O box
- Container electrical control system cabinet
- Touch screen monitor
- 120 V AC load center
- Electronics room
- Motor control center
- Auxiliary load center
- Right voltage cabinets with isolators
- Master panel board

Loading control center

- Space for mine communications equipment
- Touchscreen GUI and optional remote camera system
- Armament mounted, pivotable, grip joystick
- 6-Way power adjustable air suspension seat with heat and vibratory massage

Features and customization

The P&H 4100C BOSS is built with several features to enhance safety, reliability, and productivity over the lifecycle of the operation:

- Automatic lubrication and compressed air systems with advanced diagnostic and control
- Temperature monitoring system for all AC motors, drum shaft bearings, and hoist shaft bearings
- Automatic Boom Soft Setdown System (ABSS) and boom profile protection envelope to help prevent excessive loading to the attachment during operation
- Anti-swing-in-bank system to reduce excessive side loading on handle and attachment
- Remote hoist control pendant and hoist rope winch to assist in safe and efficient rope changeouts
- House pressurization system to provide filtered air for cooling and dust repression

The shovel has multiple options for local and minesite specific conditions in the following areas:

- Climate control
- Technology and software
- Maintenance systems

Ground pressure and weight

**Bearing area – ground pressure**

<table>
<thead>
<tr>
<th>Description</th>
<th>Standard</th>
<th>Optional</th>
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<tbody>
<tr>
<td>Crawler bearing area (138&quot;)</td>
<td>0.0631 m²</td>
<td>0.0921 m²</td>
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<tr>
<td>Crawler ground pressure (138&quot;)</td>
<td>2.34 kg/cm²</td>
<td>3.41 psi</td>
</tr>
<tr>
<td>Optional Crawler bearing area (138&quot;)</td>
<td>0.0921 m²</td>
<td>0.0921 m²</td>
</tr>
<tr>
<td>Crawler ground pressure (130&quot;)</td>
<td>2.40 kg/cm²</td>
<td>3.41 psi</td>
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**Weights – approximate**

<table>
<thead>
<tr>
<th>Description</th>
<th>138&quot; shoes / 3505 mm</th>
<th>130&quot; shoes / 3302 mm</th>
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<tbody>
<tr>
<td>Working weight (with dipper, approx. wt.)</td>
<td>1,410,184 kg</td>
<td>1,424,711 kg</td>
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<tr>
<td>Counterweight (punchings)**</td>
<td>170,551 kg</td>
<td>376,000 lbs</td>
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* All weights subject to 5% variation.
** To be furnished by customer.

Contact a Komatsu Mining service representative for more information on the P&H 4100C BOSS or visit https://mining.komatsu